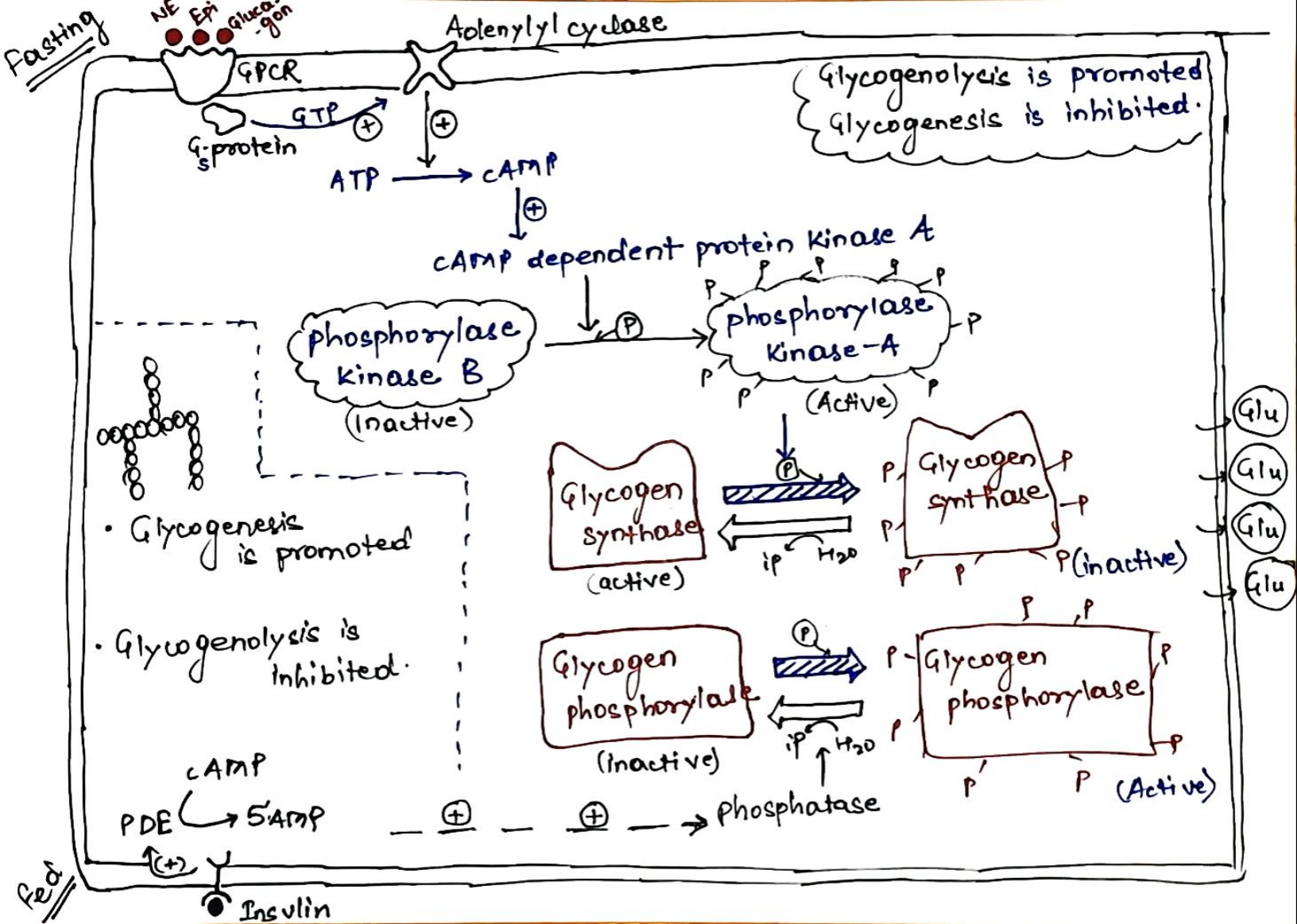
REGULATION of GLYCOGEN METABOLISM.

- HORMONAL REGULATION
  - cAMP dependent
    - Fed state
      - "INSULIN"
    - Fasting / Stress / exercise
      - "GLUCAGON" (Liver)
      - "EPINEPHRINE" } Liver & Muscle
      - "NOREPINEPHRINE" }
  - cAMP independent
- ALLOSTERIC REGULATION


Fasting
NE
Epi
Glucagon
GPCR
Adenylyl cyclase
Glycogenolysis is promoted
Glycogenesis is inhibited.
G-protein
GTP
ATP
cAMP
cAMP dependent protein Kinase A
phosphorylase Kinase B
(inactive)
phosphorylase Kinase-A
(Active)
Glycogen synthase
(active)
Glycogen synthase
P(inactive)
Glycogen phosphorylase
(inactive)
Glycogen phosphorylase
(Active)
Glu
Glu
Glu
Glu
• Glycogenesis is promoted
• Glycogenolysis is inhibited.
cAMP
PDE
5'AMP
Phosphatase
fed
Insulin

∴ Fasting state / stress / Exercise

* Active hormone :- Glucagon in Liver
  NE; Epi in Liver & Muscle

* phosphorylation of both glycogen synthase & glycogen phosphorylase
  glycogen synthase becomes INACTIVE
  glycogen phosphorylase becomes ACTIVE

Hence; Glycogenolysis is promoted
& Glycogenesis is inhibited

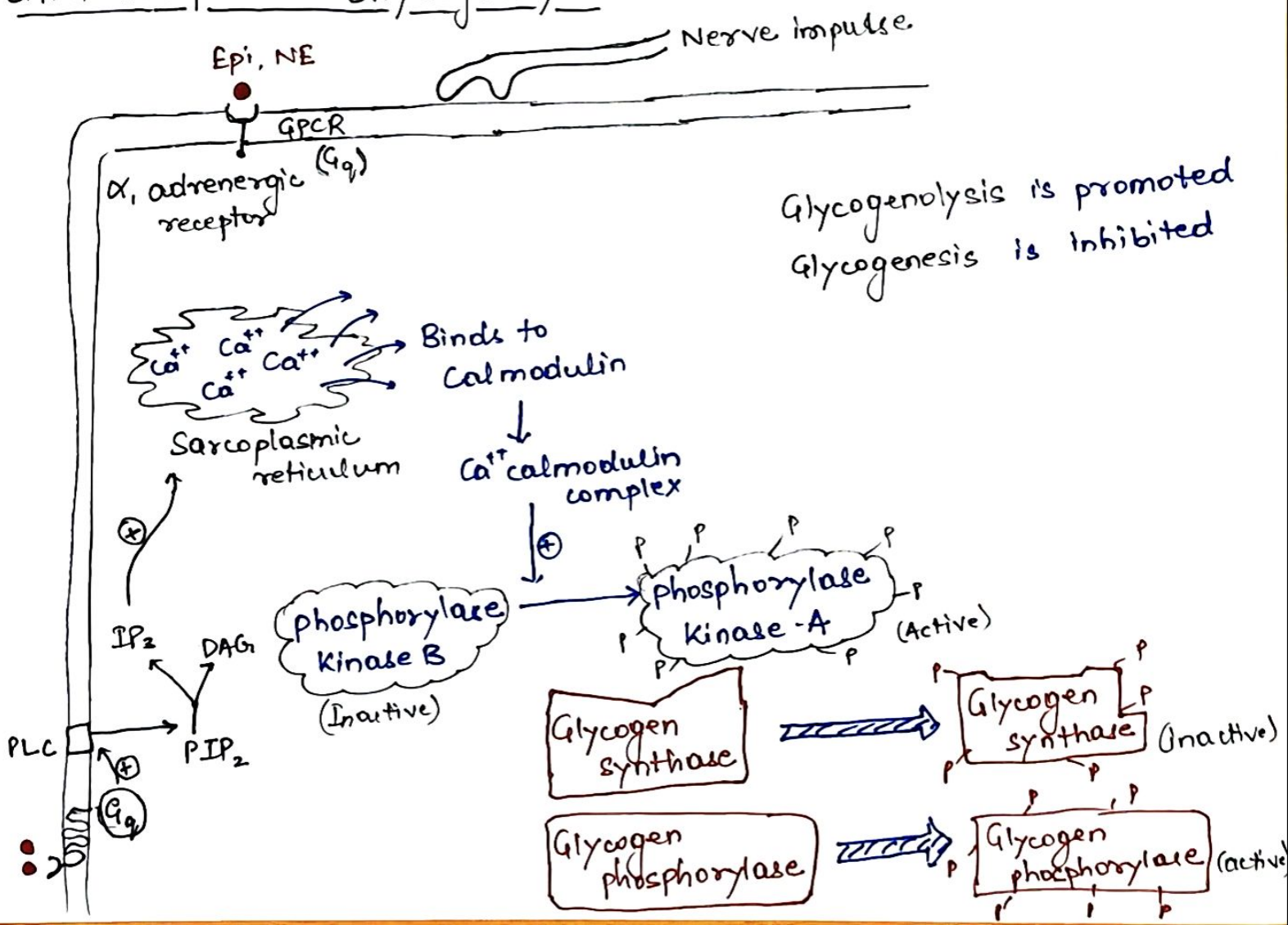
∴ Well fed state

* Active hormone :- Insulin

* Dephosphorylation of both glycogen synthase & glycogen phosphorylase
  glycogen synthase becomes ACTIVE
  glycogen phosphorylase becomes INACTIVE

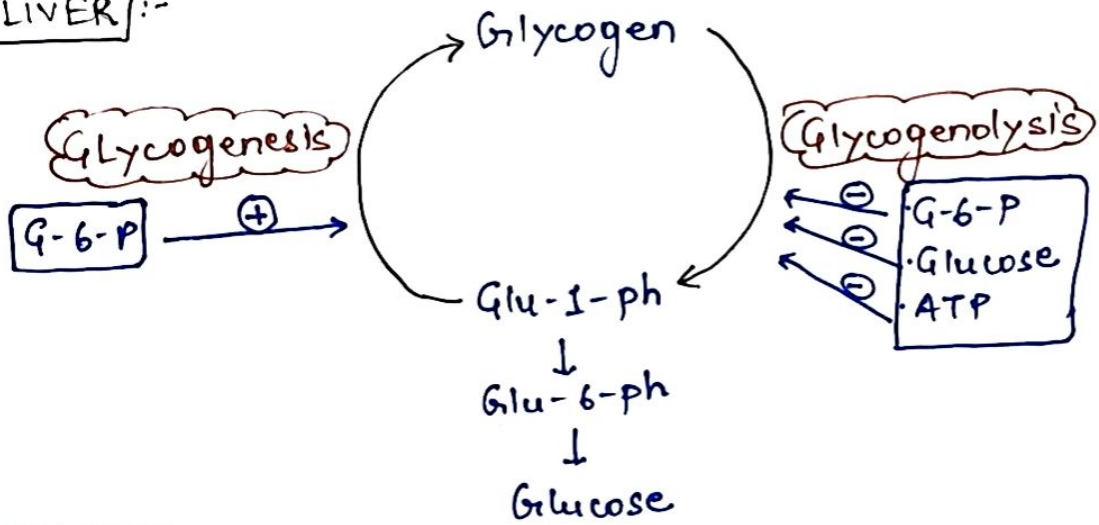
Hence; Glycogenesis is promoted
Glycogenolysis is inhibited

cAMP independent Glycogenolysis



ALLOSTERIC REGULATION

In LIVER :-



In Muscle :-